

Appln No. 09/882,351
Amdt date February 28, 2005
Reply to Office action of August 26, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of preparing a plurality of encapsulated particles for use as a positive active material for a lithium secondary battery comprising:

preparing a coating solution by dissolving in a solvent a conductive agent and first and second conductive polymers wherein the first conductive polymer is selected from the group consisting of polypyrrole, polyaniline, polythiophene, polyacetylene, derivatives thereof, and mixtures thereof; and the second conductive polymer is an ionic conductive polymer different from the first conductive polymer; and

coating lithium complex metal oxide particles with the coating solution to thereby encapsulate the particles with the coating solution, wherein the second ionic conductive polymer is present in an amount ranging from about 0.1 to about 5 wt% based on the weight of the metal oxide.

2. (Original) The method of claim 1, wherein said coating step is carried out by using an agglomerator or a spray dryer.

3. (Canceled).

4. (Previously Presented) The method of claim 1, wherein said first conductive polymer is emeraldine base or a polymer in doping state.

5. (Canceled).

6. (Canceled).

7. (Previously Presented) The method of claim 1, wherein said second conductive polymer is selected from the group consisting of polyethylene oxide, polypropylene oxide, polyethylene glycol, derivatives thereof, salts thereof and mixtures thereof.

8. (Original) The method of claim 1, wherein said lithium complex metal oxide is selected from the group consisting of $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2$, $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{O}_{2-z}\text{A}_z$, $\text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z$, $\text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4$, $\text{Li}_x\text{M}_{1-y}\text{M}''_y\text{A}_2$, $\text{Li}_x\text{MO}_{2-z}\text{A}_z$, $\text{Li}_x\text{Ni}_{1-y}\text{Co}_y\text{O}_{2-z}\text{A}_z$, $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}''_z\text{A}_\alpha$, and $\text{Li}_x\text{Ni}_{1-y-z}\text{Mn}_y\text{M}'_z\text{A}_\alpha$, wherein $0.95 \leq x \leq 1.1$, $0 \leq y \leq 0.5$, $0 \leq z \leq 0.5$, $0 < \alpha \leq 2$, M is Ni or Co, M' is at least one element selected from the group consisting of Al, Ni, Co, Cr, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, and Lr, M'' is at least one element selected from the group consisting of Al, Cr, Mn, Fe, Mg, Sr, V, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, Lu, Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, and Lr, and A is selected from the group consisting of O, F, S and P.

9. (Original) The method of claim 8, wherein said lithium complex metal oxide is selected from the group consisting of $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{A}_2$, $\text{Li}_x\text{Mn}_{1-y}\text{M}'_y\text{O}_{2-z}\text{A}_z$, $\text{Li}_x\text{Mn}_2\text{O}_{4-z}\text{A}_z$, and $\text{Li}_x\text{Mn}_{2-y}\text{M}'_y\text{A}_4$.

10. (Original) The method of claim 1, wherein the amount of coated conductive polymer ranges from 1 to 30 wt% based on the weight of the lithium metal oxide.

11. (Original) The method of claim 1, wherein the amount of coated conductive polymer ranges from 1 to 10 wt% based on the weight of the lithium metal oxide.

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12. (Original) The method of claim 1, wherein the lithium complex metal oxide is coated with the coating solution to form a coating layer having a thickness ranging from 0.1 to 1 μm .

13. (Previously Presented) The method of claim 1, wherein the lithium complex metal oxide particles are coated generally evenly over their entire surfaces.

14. (Currently Amended) A method of preparing a plurality of encapsulated particles for use as a positive active material for a lithium secondary battery comprising:

preparing a coating solution by dissolving in a solvent a conductive agent and first and second conductive polymers wherein the first conductive polymer is selected from the group consisting of polypyrrole, polyaniline, polythiophene, polyacetylene, derivatives thereof, and mixtures thereof; and the second conductive polymer is an ionic conductive polymer different from the first conductive polymer; and

coating lithium-containing manganese-based metal oxide particles with the coating solution to thereby encapsulate the particles with the coating solution, wherein the second ionic conductive polymer is present in an amount ranging from about 0.1 to about 5 wt% based on the weight of the metal oxide.

15. (Canceled).

16. (Canceled).

17. (Previously Presented) The method of claim 14, wherein the amount of coated conductive polymer ranges from 1 to 30 wt% based on the weight of the lithium metal oxide.

18. (Previously Presented) The method of claim 14, wherein the amount of coated conductive polymer ranges from 1 to 10 wt% based on the weight of the lithium metal oxide.

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19. (Previously Presented) The method of claim 14, wherein the lithium complex metal oxide is coated with the coating solution to form a coating layer having a thickness ranging from 0.1 to 1 μm .

20. (Previously Presented) The method of claim 14, wherein the lithium complex metal oxide particles are coated generally evenly over their entire surfaces.

21. (Previously Presented) The method of claim 1, wherein the lithium complex metal oxide particles are coated over their entire surfaces.

22. (Previously Presented) The method of claim 14, wherein the lithium complex metal oxide particles are coated over their entire surfaces.

23. (Previously Presented) The method of claim 14, wherein said second conductive polymer is selected from the group consisting of polyethylene oxide, polypropylene oxide, polyethylene glycol, derivatives thereof, salts thereof and mixtures thereof.